AMENDMENTS TO THE SPECIFICATION

IN THE SPECIFICATION:

Before line 1 on page 1 please insert:

--This nonprovisional application claims priority under 35 U.S.C. § 119(a) on Patent Application No(s). 2002-270725 filed in JAPAN on September 17, 2002, which is(are) herein incorporated by reference.--

Please replace the paragraph beginning on page 3, line 17 as follows:

It is therefore a feature of the present invention to provide an ink cartridge and an image forming apparatus that are capable of increasing an available range of design indices for the ink absorbing body.

Please replace the paragraph beginning on page 3, line 21 as follows:

Another feature of the present invention is to provide an ink cartridge and an image forming apparatus which provide design indices for the ink absorbing body in accordance with properties of the ink, so as to prevent problems such as depletion of the ink caused when continuous ejection is performed, and ink leakage caused when the ink cartridge is inserted or detached.

Please replace the paragraph beginning on page 4, line 16, as follows:

In determining an ink retaining power of the ink cartridge, the height of the ink cartridge including the ink containing section, non-uniformity among cells of a foam material (expandable foam) used as the ink absorbing body, and vibration applied to the ink cartridge may be considered. This is because an insufficient ink retaining power causes the problem of ink leakage when the ink cartridge is inserted or detached.

Please replace the paragraph beginning on page 12, line 22, as follows:

In determining the ink retaining power of the ink cartridge, the height of the ink cartridge including the ink containing section, non-uniformity among cells of the foam material (expandable foam) used as the ink absorbing body, and vibration applied to the ink cartridge may be considered. This is because an insufficient ink retaining power causes the problem of ink leakage when the ink cartridge is inserted or detached.

Please insert the following paragraph on page 23, line 21, after the heading "Brief Description of the Drawings":

In the drawings:

Please replace the paragraph beginning on page 23, line 21 as follows:

Fig. 1 is a graph according to one embodiment of an ink jet recording apparatus of the present invention, showing a relationship between efficiency and actual cell density $M=N \cdot R$ (cells/inch);[[.]]

Please replace the paragraph beginning on page 23, line 25 as follows:

Fig. 2 is a perspective view illustrating an overall structure of the ink jet recording apparatus, with a portion of the ink jet recording apparatus seen through;[[.]]

Please replace the paragraph beginning on page 24, line 3 as follows:

Fig. 3 is a block diagram illustrating a schematic structure of an ink supplying apparatus for the inkjet recording apparatus;[[.]]

Please replace the paragraph beginning on page 24, line 6 as follows:

Fig. 4(a) is a cross-sectional view illustrating a structure of an ink cartridge; Fig. 4(b) is a cross-sectional view illustrating a state in which an ink supplying path is detached from the ink cartridge; and Fig. 4(c) is a cross-sectional view illustrating a structure of detecting electrodes;[[.]]

Please replace the paragraph beginning on page 24, line 12 as follows:

Fig. 5 is a front view illustrating a structure of a filter of the ink supplying apparatus;[[.]]

Please replace the paragraph beginning on page 24, line 14 as follows:

Fig. 6 is a graph showing a relationship between time and the negative pressure generated by the ink cartridge when ink is continuously ejected from the ink cartridge fully charged with the ink;[[.]]

Please replace the paragraph beginning on page 24, line 18 as follows:

Fig. 7 is a schematic representation of the graph shown in Fig. 6;[[.]]

Please replace the paragraph beginning on page 24, line 20 as follows:

Fig. 8 is a cross-sectional view illustrating an enlarged view of a structure of an end portion of a supplying throat;[[.]]

Please replace the paragraph beginning on page 24, line 23 as follows:

Fig. 9 is a graph showing a relationship between efficiency and cell density N (cells/inch);[[.]]

Please replace the paragraph beginning on page 24, line 25 as follows:

Fig. 10 is a schematic diagram showing a relationship between flow rate and pressure difference within a conduit, assuming that each cell of a foam material of the ink cartridge is a round conduit;[[.]]

Please replace the paragraph beginning on page 25, line 4 as follows:

Fig. 11 is a schematic diagram illustrating cells closely packed together;[[.]]

Please replace the paragraph beginning on page 25, line 6 as follows:

Fig. 12 is a cross-sectional view illustrating a state in which spherical or polyhedral cells are linked together in a beads-like manner in an actual foam material of the ink cartridge;[[.]]

Please replace the paragraph beginning on page 25, line 10 as follows:

Fig. 13 is an explanatory diagram illustrating how effective diameter is calculated, assuming that the cells in an actual foam make up a flow path by being linked together in a beads-like manner;[[.]]

Please replace the paragraph beginning on page 25, line 14 as follows:

Fig. 14 is a graph illustrating a relationship between X and resistance ratio Rd/Rm and between X and cell diameter d, where Rd is the normalized flow path resistance calculated by performing integration on a spherical flow path by assuming that the center of the spherical flow path is X=0, and Rm is the normalized flow path resistance of a column-shaped flow path;[[.]]

Please replace the paragraph beginning on page 25, line 21 as follows:

Fig. 15 is a graph showing a relationship between compressibility and negative pressure;[[.]]

Please replace the paragraph beginning on page 25, line 23 as follows:

Fig. 16 is a schematic diagram illustrating critical pressure on a liquid surface (meniscus) in a capillary tube, assuming that cells at a lower end of the foam material make up a capillary tube in a state immediately before the ink in the ink cartridge is depleted;[[.]]

Please replace the paragraph beginning on page 26, line 3 as follows:

Fig. 17 is a schematic diagram illustrating critical pressure on a liquid surface (meniscus) in the capillary tube; and[[.]]

Please replace the paragraph beginning on page 35, line 13, as follows:

In determining ink retaining power of the ink cartridge, a height of the ink cartridge 20, variances among the foam cells, and the vibration applied to the ink

cartridge 20 may be considered. This is because poor ink retaining power causes the problem of accidental ink leakage when the ink cartridge is inserted or detached in a fully charged state.

Please replace the paragraph beginning on page 45, line 15, as follows:

A condition for preventing the problem of accidental ink leakage caused when the ink cartridge 20 is inserted or detached is that the critical pressure, which is the ink retaining power of the foam material, needs to be larger than the ink head pressure.

Please replace the paragraph beginning on page 46, line 5, as follows:

In the ink cartridge 20, the head pressure is $9.8\times10^{3}\cdot\gamma\cdot h$ (Pa) when it is assumed that the ink has a head height h(m) relative to the ink supplying throat 24, and that the specific gravity of the ink is γ. Therefore, the critical pressure Pt (Pa) in Expression (9) may satisfy the following condition:

Please replace the paragraph beginning on page 47, line 12, as follows:

Considering a distribution of cell diameter for example, the safety factor is no less than 2. Therefore,

$$T \cdot N \cdot R \cdot B \geq 2 \cdot \gamma \cdot h \quad \ldots(12)$$

or

$$T \cdot M \cdot B \geq 2 \cdot \gamma \cdot h \quad \ldots(13)$$

where B is a coefficient B=0.0161.

Please replace the paragraph beginning on page 47, line 19, as follows:

Commonly, the ink cartridge has a height less than approximately 40mm, taking into account fluctuations of the ink level. Therefore, the critical pressure is about 0.8kPa ($0.08mH_2O$) when the safety factor is 2. The critical temperature can be maintained at or above 0.8kPa by satisfying

Please replace the paragraph beginning on page 49, line 20, as follows:

A condition for not causing depletion of the ink is abs (Pn)>abs (Ph). When the diameter of the nozzle is D(m), Expressions (6) and (8´) gives

$$(k/A) \cdot \{\mu \cdot L \cdot (N \cdot R)^2/S\} \cdot Q \leq 4 \cdot T/D \quad \ldots(16).$$

Please replace the paragraph beginning on page 50, line 2, as follows:

By plugging the actual cell density M (number/inch) into Expression (17), the condition is

$$C \cdot \{\mu \cdot L \cdot Q \cdot (M)^2/S\} \leq T/D \quad \ldots(18)$$

where C is a coefficient of $C=(k/A)/4=1.88\times10^5$.

Please replace the paragraph beginning on page 50, line 9, as follows:

Table 5 indicates that the critical pressure Pn, which is the ink drawing force generated by the meniscus that has retreated at the end of the nozzle after the ejection of the ink, becomes larger than the negative pressure of the ink supply system when the negative pressure of the supply system is no more than 1.88kPa (approximately 2.0kPa) in continuous ejection of the ink, by taking into consideration the safety ratio, that is, errors in transient vibration and flow rate. As a result, it is possible to stably supply an amount of ink even during continuous ejection of the ink.

Please replace the paragraph beginning on page 51, line 10, as follows:

The condition for the actual cell density $M=N\cdot R$ (number/inch) is given as follows from Expressions (10) and (18).

Please replace the paragraph beginning on page 52, line 6, as follows:

By plugging the actual cell density M (cells/inch) into Expression (21), the condition is given as

$$(k/A)\cdot\{\mu\cdot L\cdot Q\cdot M^2/S\}\leq 2000 \quad \ldots(22)$$

where (k/A) is a coefficient $(k/A)=7.52\times10^5$.